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ARIZONA STATE UNIVERSITY ■ COLLEGE OF BUSINESS
CENTER FOR BUSINESS RESEARCH

New Coincident Economic Indexes

Economic Growth Fastest in Phoenix Area

To provide regional measures of economic growth in Arizona, the Center for Business Research has developed a set of coincident economic indicators. Separate indexes are available for the Phoenix metropolitan area (Maricopa County), the Tucson metro area (Pima County), and non-metropolitan Arizona; an aggregate measure for the entire state also has been calculated. The methodology used to build these indexes is similar to that of the national "Index of Four Roughly Coincident Indicators," reported monthly by the U.S. Department of Commerce.

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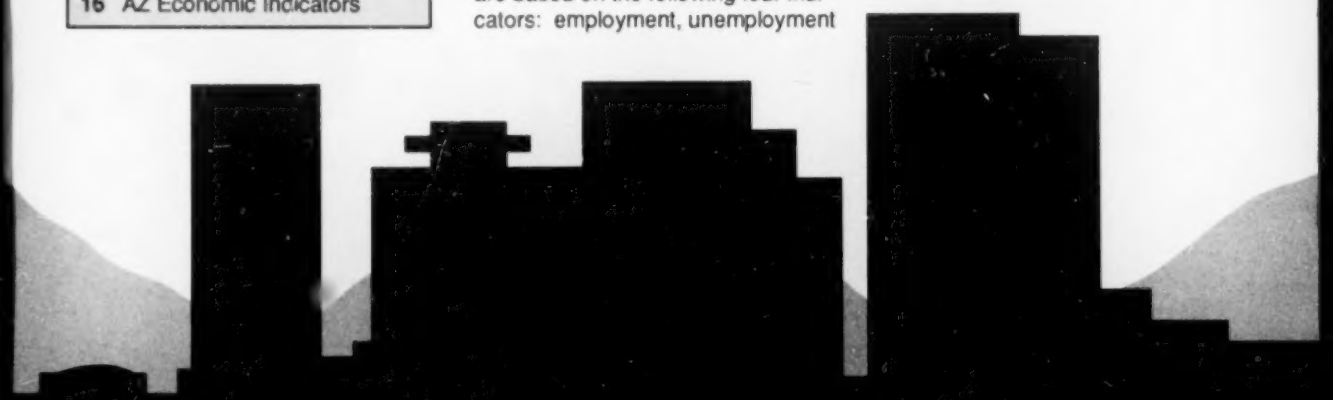
Local economies, like the national economy, follow a cycle in which contractions in business activity occur, on average, every four or five years. However, the timing and magnitude of expansions and contractions vary by area. The new coincident indexes identify turning points in the local economic cycles and measure economic growth or decline. They have the advantages of being available monthly on a reasonably current basis and of not being frequently or substantially revised.

COMPONENTS AND CONSTRUCTION

Few economic indicators accurately track the business cycle. Nationally, only four are included in the coincident index: personal income, industrial production, employment, and manufacturing and trade sales. Since most of these indicators are not available except at a national level, the indexes for the local areas are based on the following four indicators: employment, unemployment rate, retail sales and commercial building permits. One of these alone is not a consistent measure of the economy; when combined, however, they accurately track the economic cycle.

To construct a coincident index, data for each of these four measures are seasonally adjusted. Monthly percent changes are computed by a formula that produces symmetrical positive and negative changes, which are then standardized by the long-term average percent change. A composite change is computed from the weighted sum of the component changes (employment and the unemployment rate are given greater weights than retail sales and commercial building permits) and a trend-adjustment factor. The latter adjusts the growth of the coincident index to equal the long-term average growth of the Arizona economy, as measured by the

See "Coincident Indexes," page 2



ARIZONA BUSINESS

VOLUME 35, NUMBER 3
MARCH 1988

"Coincident Indexes," from page 1

Gross State Product. Finally, an index is calculated, with the annual average of 1982 equal to 100. The Arizona composite index is simply the weighted average of the three local measures.

The coincident index for the Phoenix area begins in January 1970. Since building permit information is not available prior to 1974 except in Maricopa County, the other counties' coincident indexes begin in January 1974.

HISTORY AND INTERPRETATION

Because the coincident indexes rarely move countercyclically (rising during recessions or falling during expansions), they provide an accurate measure of turning points in the economic cycle. During expansions, the monthly change in Maricopa County is positive 90 percent of the time, with more than 50 percent of the months registering a gain in excess of 0.6 percent. Slightly more than 80 percent of the changes are positive in Pima County and in the rural area; approximately one-half of the increases equal or exceed 0.5 percent. During recessions, 15 to 20 percent of the changes are positive in all areas. Approximately one-half decline at least 0.4 percent.

Decision Rule

In the Arizona and Maricopa County coincident indexes, two consecutive advances or declines totaling approximately 1 percent or more reliably indicate the end of, respectively, a recession or an expansion. No false signal ever has been generated by this criterion; two successive countercyclical changes never have accumulated to more than 0.5 percent.

The other coincident indexes are more erratic, especially that for Pima County. Whether these variations are due to data insufficiencies or to true fluctuations in economic conditions is difficult to ascertain. Consecutive declines totaling at least 1 percent have occurred three times in Pima County without further weakness ensuing. For both the Tucson area and for rural Arizona, large, single-month, countercyclical changes are not uncommon.

History

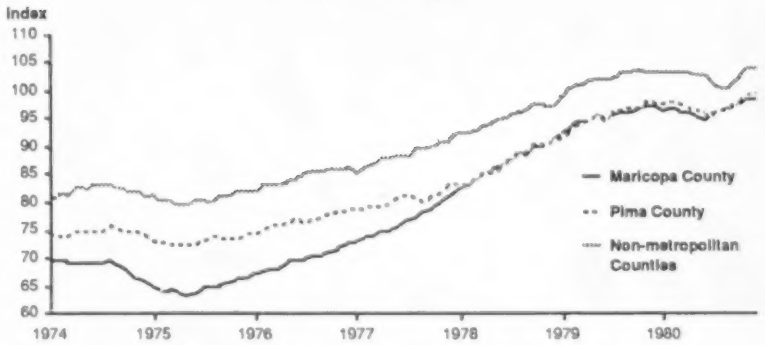
The history of the coincident indexes since 1974 is shown in Figures I and II. The most obvious feature of these graphs is that growth in Maricopa County has surpassed that in Pima County and non-metropolitan Arizona; expansion in the rural area has lagged. Expansions and recessions generally occur at roughly the same time in each area.

The outstanding growth of the Phoenix area is best seen in the two long expansions of the late 1970s and mid-1980s. In each case, rural area growth lagged badly. The pattern during recessions is not consistent. The Phoenix area economy declined more in 1974-75, about the same in 1980, and less in 1981-82 than the economies of the other areas.

More detailed information on cyclical turning points and on magnitude of growth or decline is provided in Table 1. Among the three areas, turning points generally are no more than two months apart. Though the Phoenix area economy technically peaked in December 1973, several months before the other two areas, its growth was flat; the others grew slightly.

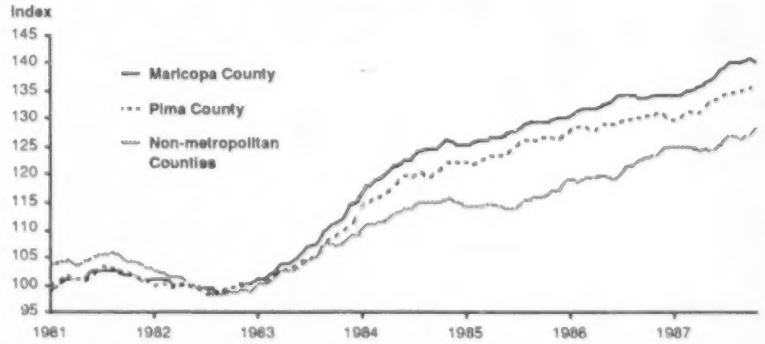
Though the non-metropolitan economy peaked one month before the others in 1979, its recession lasted two months beyond those of the metro areas. Most of the decline did not occur until after the other economies had bottomed out. The only other timing differences have occurred since 1984 and are discussed in the next section.

FIGURE I
MONTHLY COINCIDENT INDEXES, 1974-80
(1982 = 100)



Source: Center for Business Research, College of Business, Arizona State University

FIGURE II
MONTHLY COINCIDENT INDEXES, 1981-87
(1982 = 100)

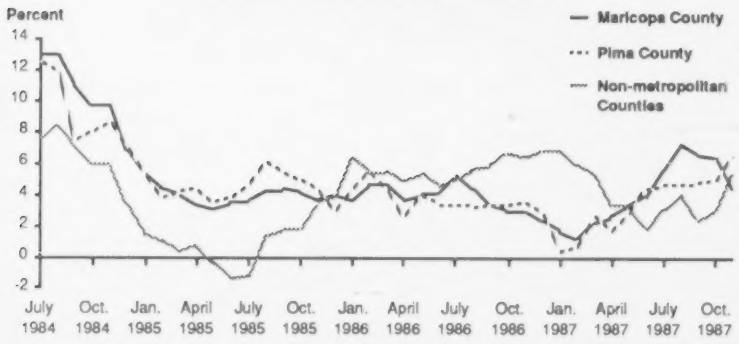


Source: Center for Business Research, College of Business, Arizona State University

CURRENT CYCLICAL PERFORMANCE

After the end of the last recession in 1982, business activity in each of the three areas expanded rapidly. In early 1984, growth rates in each area were the highest since the coincident indexes began. However, the peak in rural Arizona of 11 percent was much less than the annual

FIGURE III
MOVING AVERAGE PERCENT CHANGE IN MONTHLY COINCIDENT INDEXES



Source: Center for Business Research, College of Business, Arizona State University

TABLE 1
ECONOMIC TURNING POINTS AND GROWTH RATE CHANGES

	Maricopa County		Pima County		Non-metropolitan Area	
	Date	*Percent Change*	*Date*	*Percent Change*	*Date*	*Percent Change*
Peak	12/73	32.3	8/74	NA	7/74	NA
Trough	5/75	-9.0	6/75	-4.7	5/75	-4.4
Peak	11/79	53.5	11/79	35.4	10/79	30.0
Trough	6/80	-2.7	6/80	-2.6	8/80	-3.1
Peak	6/81	8.4	7/81	8.5	8/81	5.5
Trough	9/82	-3.8	7/82	-5.2	8/82	-7.4
Peak	None		None		11/84	17.9
Trough	None		None		6/85	-1.8
Total since 1982 trough		41.6		39.5		31.3

NA = Not available

Source: Center for Business Research, College of Business, Arizona State University

rates of 16 percent in Pima County and 17 percent in Maricopa County.

The economic performances of the local areas have varied greatly since 1984. By early 1985, growth rates in all areas had dipped below the state's long-term annual average of 5.7 percent; the weakness was particularly apparent during the first seven months of 1985. However, while growth continued in the metropolitan areas – slightly less rapidly in Phoenix than in Tucson – the rural economy slipped into a brief, mild recession.

Growth remained relatively slow during 1986 in the urban areas, though the pace in the Phoenix area recovered sufficiently to again surpass that of the Tucson area. Rural Arizona, however, recovered from its 1985 recession by expanding at above-average rates.

In late 1986 and early 1987, another period of economic weakness affected the metro economies, with growth nearly stalling, especially in Tucson. Just as the urban areas were recovering in spring 1987, the non-metro economy faltered. Until November, the rural economy remained the weakest in the state, at annual growth rates of approximately 3 percent. The metro areas' economies recovered to growth rates near 5 percent in Tucson and more than 6 percent in Phoenix.

These changes can be tracked in Figure III. The moving average percent change compares a monthly index to the average of the preceding 12 months. The formula used results in a slight lag in the moving average.

NOVEMBER 1987

Economic performance diverged considerably during November. Non-urban Arizona led the growth for the second straight month, with a 1.5 percent jump, the fifth largest since the 1981-82 recession. This index reached a new high at 128.8. In metro Tucson, the advance was nearly as large at 1.1 percent, pushing this index to a record 137.0. In contrast, the index for metro Phoenix fell 0.6 percent to 139.9, the largest decline since 1982.

Much of the difference in performance can be traced to the commercial-building-permit component. Its drop in Maricopa County was an aberration that probably will be largely offset in December's figure. In contrast, gains in this component in the other areas did not completely negate big declines in October.

Changes in the unemployment rate also contributed to regional variation. The unemployment rate rose in the Phoenix area, was nearly stable in metro Tucson, and plunged in rural Arizona. Employment growth was nil in the Phoenix area but moderate in the rest of the state. Retail sales dipped in all areas.

The wide differences in November's performance caused the moving average percent changes to swing considerably (see Figure III). Compared to the November 1986 index, each area's index is approximately 4.5 percent higher – a subpar growth rate.

The composite statewide measure was flat in November, remaining at a record high 137.4.

– **Tom R. Rex**
Research Manager

Indexes To Be Reported Monthly

The coincident indexes for Maricopa County, Pima County, rural Arizona and the entire state will be reported monthly in *Arizona Business*. A three-month lag will occur from the end of the month in question. The information can be received about one month sooner by calling the Center for Business Research at (602) 965-3961; it also may be reported at that time by some of the local media.

These indexes represent one of a series of efforts by the Center to report economic and demographic information on a geographically disaggregated basis. Other products that will be reported in coming months include population estimates and projections as well as the Gross County Products.

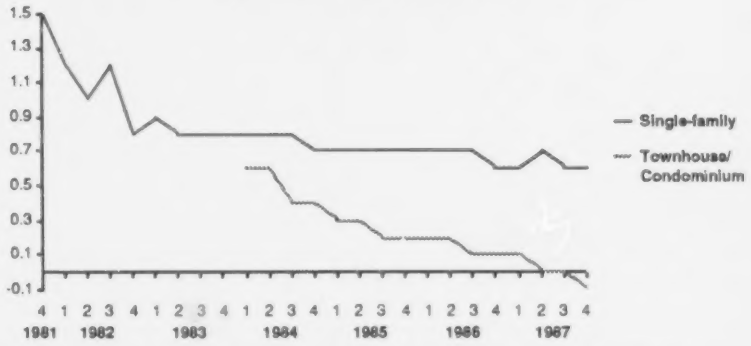
'87 Metro Phoenix Housing Appreciation

Rates Slow for Single-family Homes, Stall for Townhouses/Condos

The median annual rate of appreciation for single-family homes in the Phoenix metropolitan area declined slightly to approximately 2.4 percent in 1987, fractionally less than in any year since the study of appreciation rates began in 1981. Townhouses and condominiums (hereafter referred to as townhouses or townhomes) did not appreciate; their rate was 0.0 percent.

Of all homes sold more than once between 1981 and 1987, 30,336 constitute the single-family data base. Another 2,724 homes make up the townhouse data base. Throughout this article, less detail is provided on townhouses because of their relatively small number.

FIGURE I
MEDIAN RATE OF METRO PHOENIX HOME APPRECIATION
By Quarter of Subsequent Sale



Note: Quarterly data for townhouses/condominiums are not available prior to 1984 due to an insufficient number of sales.

Source: Arizona Real Estate Center, College of Business, Arizona State University

HOUSING APPRECIATION, 1981-87

The single-family home appreciation rate has slowed gradually since 1981 (see Figure I). The townhouse rate has decelerated more sharply since its measure began in 1984.

The appreciation rate did not keep up with inflation in consumer prices between 1983 and 1987 (see Table 1). The median sales price for both single-family homes and townhomes rose more than either the appreciation or inflation rate. However, the higher rates are due to increases in the size of the typical home; the median sales price per square foot advanced less than the inflation rate.

By Price

Home price exerts the strongest influence on the rate of appreciation. Single-family homes that sold for more than $100,000 appreciated about twice as fast as those that sold for less than $60,000. This relationship between price and appreciation also holds after adjusting the sales price for home size. Homes that sold for more than the median square-foot amount of $54 appreciated 4.0 percent per year, compared to a rate of 2.4 percent per year for less expensive homes. These rates are the same as last year's, when a median per-square-foot amount of $53 was used.

TABLE 1
INFLATION MEASURES

	Percent Change					
	1983	*1984*	*1985*	*1986*	*1987*	*1983-87 Total**
Metropolitan Phoenix Consumer Price Index	1.6	5.8	5.0	1.3	4.1	19.0
U.S. Consumer Price Index	3.2	4.3	3.6	1.9	3.7	17.8
Phoenix Area						
All single-family homes:						
Appreciation rate	3.6	3.2	2.9	2.8	2.5	15.9
Median sales price	4.8	6.3	4.0	6.0	4.8	28.7
New single-family homes:						
Appreciation rate	5.7	4.7	4.8	4.2	3.7	25.3
Median sales price	6.0	9.9	8.1	7.4	7.2	45.0
Existing single-family homes:						
Appreciation rate	2.9	2.7	2.6	2.4	2.1	13.4
Median sales price	4.6	4.8	3.2	6.1	4.5	25.4
Median sales price per square foot	2.9	3.0	2.2	3.5	2.4	14.8
All townhouses and condominiums:						
Appreciation rate	NA	NA	1.3	0.7	0.1	NA
Median sales price	1.8	8.8	1.0	3.5	−2.1	13.4
Existing townhouses and condominiums:						
Appreciation rate	NA	NA	1.5	1.1	0.2	NA
Median sales price	2.9	3.3	−1.6	3.1	−0.6	7.2
Median sales price per square foot	3.3	2.5	−1.4	4.3	7.4	16.0

*Calculated at a compound rate

NA: Not available due to insufficient number of sales

Source: Arizona Real Estate Center and Center for Business Research, College of Business, Arizona State University. U.S. Consumer Price Index is from the U.S. Department of Labor, Bureau of Labor Statistics.

New single-family homes that sold for approximately $110,000 to $120,000 had the highest rate of appreciation – about 5.6 percent annually. For resale homes, the highest rate – 4.0 percent – applied to homes selling for $150,000 or more. However, the peak rate for both new and resale homes was only slightly higher than the rate for all homes priced greater than $100,000.

The least expensive homes appreciated less than other homes; resale single-family homes priced less than $40,000 did not appreciate at all. Resale townhouses in the same price range depreciated more than 3 percent.

New vs. Resale Homes

While a "new" single-family home (defined as one constructed and later resold between 1981 and 1987) appreciated faster than an existing home in all price ranges greater than $70,000, the difference is largely illusory. The more rapid appreciation rate of new homes - nearly double the rate of existing homes - lasted only until the first resale of the home. At least a portion of the gain reflects additional expenses that most buyers of new homes incur in making improvements, such as landscaping, which add to the value of the property. Further, new homes generally are more expensive than resale homes, even on a price-per-square-foot basis. Thus, new homes appreciate faster mainly because of improvements and higher prices.

In contrast to single-family homes, new townhouses appreciated no faster than resale units from 1981 to 1987. One reason for the lower townhouse appreciation rate is the smaller price difference between new and existing townhomes. However, other factors such as relatively low demand for townhomes, probably better explain the difference.

By Geographic Area

Housing appreciation rates vary throughout the Valley (see Table 2), but most of the deviation can be explained by variations in price and the proportion of new homes. While the 1981-87 appreciation rate in a number of districts (illustrated in Figure II) was significantly different from the metro total in a statistical sense, the difference usually was slight in a practical sense. The annualized rate ranged from 2 to 4 percent in all districts except Maryvale, which was slightly lower, and Sun City West, which was considerably higher.

The highest appreciation rates occurred in the newer and/or more expensive districts of North Scottsdale and Chandler/Gilbert and in the retirement areas of Sun City West and East Mesa. The lowest appreciation rates were measured in the older and/or less expensive areas of Phoenix, including Maryvale, Christown and Metrocenter. In South Tempe and Glendale, the rates were anomalies. They were lower than expected in all price ranges and housing types, due primarily to an infrequency of homes with high appreciation rates.

Between 1981 and 1987, the appreciation rate in most districts ranged from steady to a modest decline, similar to the minimal deceleration measured Valleywide. In several districts, the rate was erratic from year to year, but this largely results from few homes reselling. The most significant downward trends occurred in Paradise Valley, Sun City and the western suburbs. Rates in Paradise Valley and Sun City fell from the second and third-highest overall in 1981-83 to slightly greater than the metro median in 1987. The western suburbs, which

TABLE 2
MEDIAN RATE OF METRO PHOENIX HOME APPRECIATION
By Geographic District, Per Quarter, Single-family Only

*District Number and Name**		*1981-83*	*1984*	*1985*	*1986*	*1987*	*1981-87*
1N	North Scottsdale	0.9	0.9	1.2	0.9	0.9	0.9"
1S	South Scottsdale	0.7	0.7	0.6	0.6	0.6	0.6
2	Paradise Valley	1.3	1.0	0.9	0.7	0.8	0.8"
3	North Sunnyslope/Moon Valley	0.7	0.7	0.6	0.6	0.5	0.6'
4N	Northwest Phoenix	0.9	0.8	0.6	0.6	0.5	0.6'
4S	Metrocenter	0.4	0.6	0.6	0.4	0.5	0.5'
5	Sun City/Youngtown/Peoria	1.2	1.3	0.9	0.9	0.7	0.8"
6	Glendale	0.8	0.7	0.6	0.5	0.5	0.6'
7	Christown	0.5	0.5	0.5	0.5	0.4	0.5'
8	North Central Phoenix	0.6	1.0	1.1	0.7	0.7	0.8
9	East Camelback	0.6	1.0	0.9	0.7	0.7	0.8
10	East Central Phoenix	0.6	1.1	0.5	0.8	0.4	0.7
11	Mid-town Phoenix	0.5	0.8	1.1	0.8	1.0	0.8
12	West Central Phoenix	0.7	0.7	0.7	0.6	0.7	0.7
13	Maryvale	0.5	0.5	0.5	0.4	0.3	0.4'
14	Downtown/South Central Phoenix	0.0	1.0	0.2	0.7	0.8	0.7
15	South Phoenix/Ahwatukee	0.8	1.1	0.7	0.9	0.7	0.8"
16N	North Tempe	0.7	0.2	0.7	0.8	0.5	0.7
16S	South Tempe	0.7	0.5	0.7	0.6	0.5	0.6'
17N	North Mesa	1.0	0.5	0.6	0.8	0.7	0.7
17S	South Mesa	0.9	1.0	0.9	0 7	0.6	0.8
18	East Mesa	1.2	0.9	0.9	0.9	0.9	0.9"
19	Chandler/Gilbert	0.9	0.9	1.1	0.9	0.9	0.9"
20	W. tern Suburbs	1.2	0.6	1.0	0.6	0.4	0.6
21	Deer Valley	1.0	0.7	0.6	0.6	0.5	0.6'
22W	Sun City West/Rural Maricopa Co.	1.6	2.2	2.5	1.7	2.0	2.1"
TOTAL, METROPOLITAN PHOENIX		0.8	0.8	0.7	0.7	0.6	0.7

*District numbers correspond to the statistical districts in Figure II on page 6.

"The mean associated with this median is significantly higher than the mean for all of metropolitan Phoenix, tested at the .01 level of statistical significance.

'The mean associated with this median is significantly lower than the mean for all of metropolitan Phoenix, tested at the .01 level of statistical significance.

Source: Arizona Real Estate Center, College of Business, Arizona State University. District designations are copyrighted by the Maricopa County Housing Study Committee.

TABLE 3
COMPARISON OF SINGLE-FAMILY-HOME TO TOWNHOUSE/CONDOMINIUM APPRECIATION
By Combined Geographic District, Per Quarter, 1981-87

	Median Percent Change Per Quarter	
District	*Single-family*	*Townhouse/Condominium*
North Scottsdale/Paradise Valley	0.9	0.4
South Scottsdale	0.6	0.2
North Central Phoenix	0.6	– 0.1
Northwest Phoenix	0.6	– 0.1
Sun City/Youngtown/Peoria	0.8	0.3
Glendale	0.6	0.1
West Phoenix	0.5	– 0.1
East Central and South Phoenix	0.8	0.2
Tempe	0.6	0.1
Southeast Valley	0.8	0.6
West Valley	1.1	1.3
North Valley	0.6	0.1
TOTAL METROPOLITAN PHOENIX	0.7	0.2

Source: Arizona Real Estate Center, College of Business, Arizona State University

had ranked third-highest, dropped below the metro median in 1987. Only in Sun City West, North Scottsdale, East Mesa and Chandler/Gilbert did home values consistently appreciate faster than the metro median.

Only in Sun City West and midtown Phoenix did home appreciation keep up with the Valley's 4.1 percent rate of inflation in 1987 – all other areas recorded slower appreciation. During 1981-87, the appreciation rates for North Scottsdale, East Mesa, Chandler/Gilbert and Sun City West have kept up with metro Phoenix inflation.

The small number of townhouses that sold more than once prevented using a geographic division with the same amount of detail as that for single-family homes. Except in the West Valley, where townhouse sales occurred primarily in Sun City West, the appreciation rate for townhouses was less than that for single-family homes (see Table 3). The geographic pattern was similar for townhouses and single-family homes.

OUTLOOK

Little change in the rate of appreciation for either single-family homes or townhouses is likely in 1988. After the aberrations of the 1970s, the residential housing market has returned to the stable conditions of preceding decades. The general inflation rate, housing affordability and supply-demand relationships remain relatively steady. An exception might be a continuation of the falling demand for townhouses, particularly for resale units, which could lower their appreciation rate slightly.

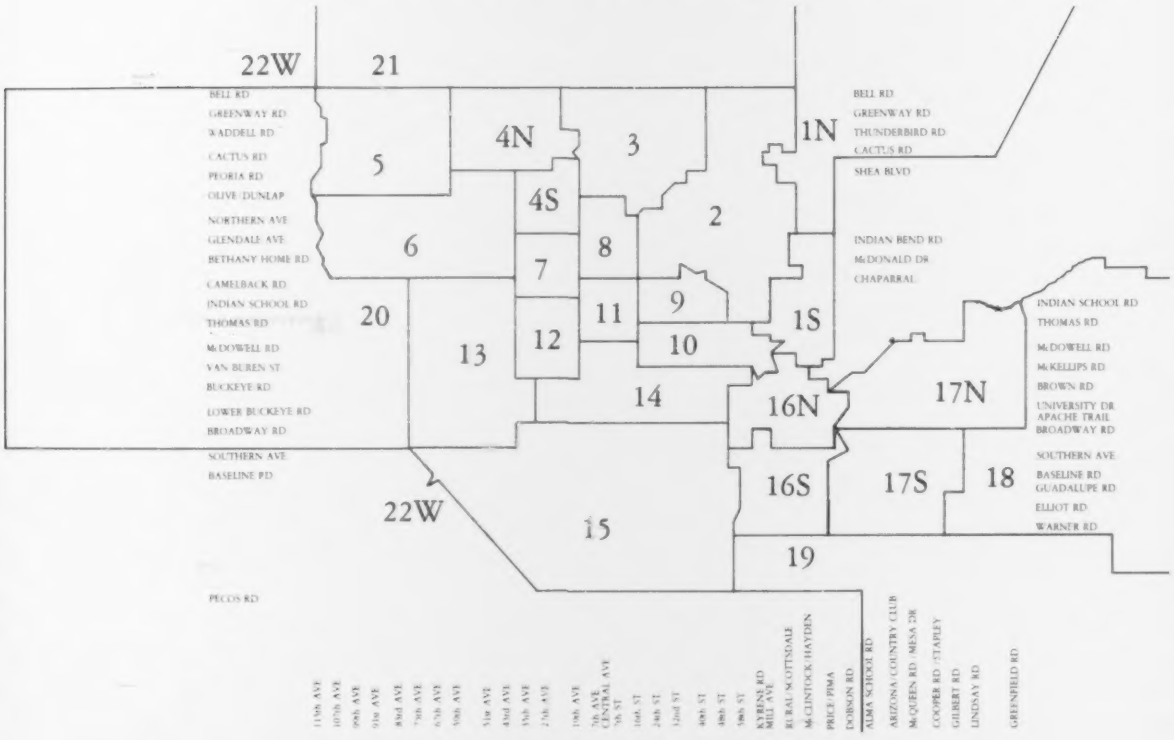
The current trend to purchase larger, more expensive homes should continue to widen the spread between appreciation rates for higher-priced and lower-priced homes. However, the higher and lower appreciation rates should offset each other, except in those areas dominated by homes at either end of the price spectrum. Overall, appreciation rates in 1988 can be expected to approximate current levels.

– **Sharla Kivett,** *Research Analyst*
Arizona Real Estate Center

Complete Report Available

This article summarizes a more detailed report on the appreciation of homes in the Phoenix area during the 1980s. Copies of the complete report, which includes a number of tables with textual interpretation, as well as analysis by district, may be obtained by calling or writing the Arizona Real Estate Center, College of Business, Arizona State University, Tempe, AZ 85287; (602) 965-5440.

FIGURE II
PHOENIX METROPOLITAN AREA STATISTICAL DISTRICTS



Note: Districts 1N, 18, 19, 21 and 22W extend to the Maricopa County boundaries. See Table 2 for single-family home appreciation data for all districts outlined above.

Source: Phoenix Metropolitan Housing Study Committee

'87 Valley Home Prices Rise By Smallest Amount Since 1982

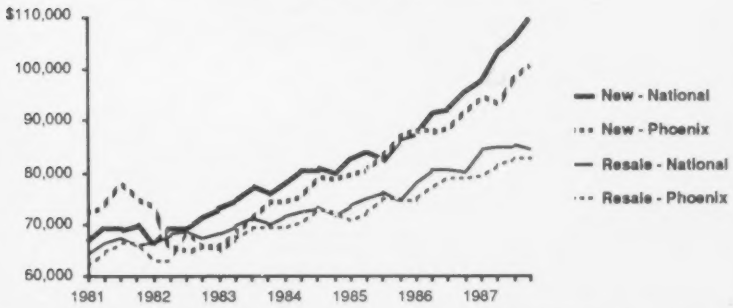
The median price of all homes sold in the Phoenix metropolitan area during 1987 was $80,050, an increase of only 2.6 percent from 1986. This advance was the smallest since 1982. Even though prices rose, the percent change was smaller than in 1986 in all categories. Prices of new single-family homes accelerated the most (7.2 percent), comparable to 1986 but lower than in 1984 or 1985.

The median price on resale single-family homes increased 4.5 percent over 1986, slowing from 6.1 percent the previous year. The median price per square foot advanced only 2.4 percent, indicating that buyers are purchasing larger homes. Thus, the change in price reflects more than simple inflation.

Townhouse and condominium prices were lower than in the previous year. The price level on resale townhouses/condominiums depreciated 0.6 percent, while new units dropped 5.5 percent, representing the first time since 1983 that new townhome prices fell from the prior year. The median price per square foot for resale townhomes was 1.4 percent higher than in 1986, suggesting that buyers purchased smaller homes for their money.

The median price of a single-family home in the Phoenix area has been lower than the national median during most of the 1980s. New-home prices in metro Phoenix were higher than those nationally in 1981, but local prices have been increasing at a slower rate since then, resulting in a growing spread between national and local prices. Phoenix resale prices have been lower than those nationally throughout most of the 1980s (see Figure I).

FIGURE I
MEDIAN SALES PRICE OF SINGLE-FAMILY HOMES
National vs. Phoenix Area



Source: Arizona Real Estate Center, College of Business, Arizona State University

NUMBER OF SALES

Home sales in the Phoenix area during 1987 posted the second highest total of the 1980s (59,250), down 6.7 percent from the 1986 record but 7.2 percent greater than the third highest total. The last quarter was weaker than the first three quarters, primarily due to higher mortgage rates and economic uncertainty.

Sales of previously owned homes fared better than new home sales in 1987, with almost as many resale homes purchased as in 1986; new home sales fell. Resale townhouses/condominiums represented the only category in which sales outperformed those of 1986.

The market share of each housing type has not changed significantly. The proportion of single-family homes sold dipped during the first quarter, offset primarily by the greater proportion of previously owned townhomes sold; both categories returned to 1986 levels by year-end. Single-family homes accounted for 81 percent of total home sales in

TABLE 1
METROPOLITAN PHOENIX HOME SALES

	Single Family			Townhouse/Condominium			
Median Sales Price	*Resale*	*New*	*Total*	*Resale*	*New*	*Total*	*Grand Total*
1981	$65,000	$74,800	$65,900	$60,000	$64,400	$60,500	$65,000
1982	65,000	66,100	65,500	59,725	47,025	57,000	64,325
1983	68,000	70,050	68,650	61,450	51,650	58,000	67,000
1984	71,250	76,950	73,000	63,500	62,600	63,100	71,025
1985	73,500	83,200	75,925	62,475	65,050	63,700	74,000
1986	78,000	89,375	80,500	64,400	69,125	65,900	78,000
1987	81,550	95,825	84,400	64,000	65,350	64,500	80,050
Number of Sales							
1981	35,000	2,410	37,410	5,260	610	5,870	43,280
1982	23,880	3,960	27,840	4,050	1,390	5,440	33,280
1983	33,640	9,560	43,200	5,060	2,540	7,600	50,800
1984	37,180	10,040	47,220	5,170	3,270	8,440	55,660
1985	38,610	10,170	48,780	4,860	2,740	7,600	56,380
1986	43,950	8,790	52,740	7,910	2,860	10,770	63,510
1987	41,380	6,840	48,220	9,020	2,010	11,030	59,250

Source: Arizona Real Estate Center, College of Business, Arizona State University; from data supplied by Marketron Services, Inc., Phoenix.

1987, while townhomes made up the other 19 percent.

OUTLOOK

Economic uncertainty and recessionary concerns pervade analysis of future home sales. Since the decision to purchase a home requires a long-term commitment, buyers must appraise their future financial prospects as well as the potential impact of state and national economic developments.

If mortgage rates perform as predicted (see affordability article, page 9), they should not exert pressure that would cause sales to decline.

Equilibrium in housing supply and demand should not change significantly; thus, prices should not be affected by shortages or surpluses. Price levels can be expected to rise more than the rate of inflation in those markets where consumers are purchasing larger homes with more amenities. Prices may continue to fall in the market for townhouses/condominiums, particularly in those areas where buyers are concerned about resale prospects.

During 1988, if mortgage rates remain relatively stable, if prices do not rise significantly, and if consumer confidence does not deteriorate substantially, sales can be expected to approximate the level of second half 1987.

The number of new Valley residents during 1988 is expected to be similar to the 1987 total (see related article, below). If this prediction is realized, new residents would increase the demand for housing units by approximately the same amount as in 1987.

– **Sharla Kivett,** *Research Analyst Arizona Real Estate Center*

Reporting of Data

The data published in this article are derived from Maricopa County's legally recorded home sales. Since some sales are not recorded, the numbers slightly underestimate total sales.

Because the recording of a real estate transaction does not reveal whether the property is new, the Center uses a separate procedure to make this determination. However, the number of new homes sold is underestimated, and the number of existing homes sold is overestimated, both by the same undetermined amount.

Net In-Migration to Valley Plunges During 1987

The net inflow of people to the Phoenix metropolitan area during fourth quarter 1987 slowed to a trickle. At only 4,000, net in-migration nearly matched the low recorded in the depths of the 1981-82 recession. Total population at year-end approximated 1,993,000.

In 1986, the flow of people to the Valley began to diminish from the 1985 record. The reduction was gradual until after first quarter 1987, when net in-migration dropped from 12,000 to 6,000 (see Figure I). For all of 1987, net in-migration totaled 30,000, less than one-half the 1986 level. Since 1970, the annual average has been approximately 44,000.

Fluctuations in net in-migration result mostly from changes in in-migration, not out-migration; and in-migration varies with local employment opportunities. New job creation slowed sharply in late 1986 and remained weak throughout 1987. As a result, in-migration to the Phoenix area declined from roughly 162,000 in 1986 to 135,000 in 1987.

Out-migration does not vary much over time. Between 1986 and 1987, it rose slightly, from approximately 100,000 to 105,000. Many of the thousands of laid-off construction workers probably left the Valley.

The ratio of people moving to, versus from, the Valley varies from somewhat more than 1.5 (three people moving in for every two who move out) during economic expansions to slightly less than 1.33 (four people moving in for every three who move out) during recessions.

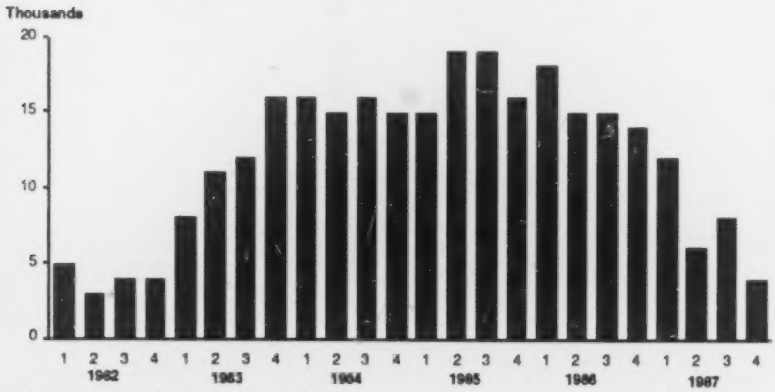
Fluctuations in in-migration have substantial effects on the Valley, particularly on certain businesses and industries. For example, migration has considerable impact on apartment absorption, discussed in the January 1988 *Arizona Business*. Vacancy rates cannot decrease much when net growth is as slow as in the fourth quarter.

Migration flows also directly affect home sales. An exact estimate of the impact is difficult to ascertain because of data insufficiencies. If the average newcomer household size is 2.7 people (equivalent to that of the resident population), the annual number of newcomer households has ranged from 46,000 to 63,000 during the 1980s. According to the *Inside Phoenix* study, since the early 1980s, nearly one-third of these households purchased a home within one year of their arrival, accounting for 16,000 to 19,000 sales per year. This number, in turn, represents one-fourth to one-third of annual home sales in the Phoenix area.

Because of the lower number of in-migrants, the estimated number of home purchases by newcomers dropped from approximately 19,000 in 1986 to 16,000 in 1987. The total number of homes sold fell slightly more than 4,000.

– **Tom R. Rex**
Research Manager

FIGURE I
NET IN-MIGRATION TO MARICOPA COUNTY



Source: Center for Business Research, College of Business, Arizona State University

1987 Valley Home Affordability Slowing

Rising household income and relatively stable annualized mortgage interest rates offset increases in home prices during 1987, modestly boosting the annual resale housing affordability index to 112, its highest level since the indexes began in 1981. New home affordability maintained the 1986 record level of 95 but did not improve. (See Table 1 for definitions of the terms used in this article).

The greater improvement in resale affordability than in new home affordability widened the spread between the indexes to the largest ever – 17 points.

Even though the 1987 annual level of affordability was high (due to low mortgage rates during the first quarter), the level for both new and resale homes fell from the first quarter record during each subsequent quarter of 1987.

An index of 100 or more indicates that a median-income household is able to qualify for a median-priced home, assuming a 15 percent down payment; a fixed-rate, conventional, 30-year mortgage; and an income qualification factor of 28 percent. During 1987, a median-income household could afford a $91,350 home – more than the $81,550 median-priced resale home but less than the $95,825 median-priced new home.

TABLE 1
HOUSING AFFORDABILITY: DEFINITION OF TERMS

Term	Definition
Affordability index	Defined in terms of the median-income household. An index of 100 indicates that a median-income household is able to qualify for a median-priced home under the assumptions provided in this table, but an index of 90, for example, suggests that such a household earns only 90 percent of the needed income.
Income	Median gross household income is estimated from median effective buying income (similar to disposable income), published in *Sales and Marketing Management*.
Income qualification factor	Federal National Mortgage Association (FNMA) guidelines state that "monthly housing expenses should not represent more than 25 to 28 percent of gross monthly income." The upper limit is used.
Interest rate	The effective interest rate on 30-year, fixed-rate, conventional mortgage loans for single-family homes includes the contract interest rate plus fees and charges, or "points," amortized over a 10-year period, computed by the Federal Home Loan Bank Board.
Loan amount	A down payment of 15 percent is assumed.
Median sales price	Single-family homes only. Metropolitan Phoenix data from real estate recordings in Maricopa County. National resale home data from National Association of Realtors; national new home data from U.S. Bureau of the Census.
Monthly housing payment	As defined by FNMA, housing expenses comprise principal, interest, taxes and insurance. Data on taxes and insurance are not available. They are estimated at 15 percent of total housing expenses, using information supplied by the National Association of Home Builders.

Source: Arizona Real Estate Center, College of Business, Arizona State University

TABLE 2
HOUSING AFFORDABILITY INDEXES
Metropolitan Phoenix; Single-family Only

			Resale Homes			New Homes		
Year	*Median Gross Monthly Income*	*Effective Interest Rate*	*Median Sales Price*	*Monthly Housing Payment*	*Affordability Index*	*Median Sales Price*	*Monthly Housing Payment*	*Affordability Index*
1981	$1,990	16.7%	$65,000	$910	61	$74,800	$1,050	53
1982	2,160	16.7	65,000	910	67	66,100	920	66
1983	2,270	13.7	68,000	790	80	70,050	820	78
1984	2,470	14.2	71,250	860	81	76,950	920	75
1985	2,640	12.9	73,500	810	92	83,200	910	81
1986	2,800	10.6	78,000	720	109	89,375	820	95
1987	3,000	10.6	81,550	750	112	95,825	880	95
Quarter								
1st 1987	$2,920	9.4%	$79,500	$660	123	$94,500	$790	104
2nd 1987	2,970	10.6	81,500	750	111	92,925	860	97
3rd 1987	3,020	10.8	82,725	780	109	98,275	920	92
4th 1987	3,080	11.4	82,800	810	106	101,000	990	87

Source: Arizona Real Estate Center, College of Business, Arizona State University. Interest rates are from the Federal Home Loan Bank Board *News*.

CHANGES IN 1987 AFFORDABILITY

The first quarter's 9.4 percent interest rate was the lowest since the index began. By year-end, interest rates had risen back to 11.4 percent, still lower than in any year prior to 1986. Prices on new single-family homes rose slightly faster than household income, coupling with the increase in interest rates to push monthly payments on the median-priced home 25 percent higher. As a result, affordability dropped from an index level of 104 during the first quarter to the fourth quarter's 87.

Resale home prices advanced slightly slower than household income, widening the spread in affordability between new and resale homes. The median resale housing payment rose almost 23 percent, lowering affordability from the first quarter's 123 to 106 at year-end.

Interest rates have been the strongest determinant of affordability during the 1980s. Even though prices rose 28 percent for new homes and 25 percent for resale homes from 1981 to 1987, monthly housing payments fell 16 percent for new and 18 percent for resale. This drop was due to the six-percentage-point decline in annualized interest rates.

AFFORDABILITY BY INCOME LEVEL

The preceding discussion assumed that a household earns the median income. Of course, most people do not earn this amount – half earn more and half earn less. Affordability for specific households can be determined by varying the median income while holding all other factors constant (see Table 3).

For example, a household earning $25,000 annually could afford a home but one that cost closer to $63,000 – lower than the price affordable to the median-income household. In contrast, a household earning $45,000 could afford a home costing $113,850, higher than the median-priced home.

NATIONAL AFFORDABILITY

Homes were more affordable locally than nationally in 1987; local incomes were higher, while interest rates and prices were lower. The national index values for both new homes (87) and resale homes (106) were lower than those locally.

Since 1981, new home prices have risen 51 percent nationally but only 28 percent in the Phoenix area. The median household income rose by a smaller amount nationally than locally (45 vs. 51 percent), and mortgage rates fell approximately the same amount on both levels.

AFFORDABILITY BY CITY

Housing affordability varies throughout the Valley, due primarily to deviations in housing prices and income levels. Only mortgage rates remain standard for all areas.

Among the larger cities for which income estimates are available, affordability of resale homes during 1987 was greatest in Glendale and Phoenix, approximately 11 index points higher than the median for the metropolitan area. Only Scottsdale's resale home affordability was lower than that for the metro area.

Glendale, the only city in which new homes were affordable to the median-income household, joined Mesa in having an affordability level greater than the metro median. New home affordability was near the metro level in Phoenix but lower in Tempe and Scottsdale.

AFFORDABILITY UNDER DIFFERENT ASSUMPTIONS

The affordability index can change substantially if the assumptions underlying its calculation are varied, as income was varied in Table 3. For example, reducing the amount of the down payment from 15 percent to 10 percent of the purchase price would lower affordability approximately six index points. If prices had remained constant at 1986 levels, affordability would have risen about six points.

Shortening the term of the loan does not reduce affordability by an appreciable amount until the length is cut to approximately 20 years. Lengthening the term past 30 years would have almost no impact.

Had 1987 mortgage rates been one percentage point lower (around 9.6 percent), affordability would have been about nine index points higher, allowing the median-income household to purchase a new home.

OUTLOOK

Mortgage rates currently are the key to affordability. If they decline slightly during the first quarter of 1988, then rise past the 1987 level during the latter half of the year, as some forecasters predict, affordability should not change much in 1988. Any change probably would be downward.

Home prices can be expected to increase, due primarily to the trend toward purchasing larger homes with more amenities. Demographics should start to affect the type of home purchased as baby boomers move into larger, more expensive homes, leaving "starter" homes behind. As a result, future median prices of new homes should rise. The ease with which existing homes can be sold also may be affected, slowing price increases on resale homes.

The median household income should continue to advance at approximately the current rate during 1988. If an economic slowdown develops in 1989, as some are predicting, income growth would slow as well, adversely affecting affordability.

If these changes in income, housing prices and interest rates occur, they should result in little or no improvement in affordability during 1988 unless interest rates were to fall unexpectedly. The spread between the new home and existing home indexes probably will widen during the year.

– **Sharla Kivett,** *Research Analyst*
Arizona Real Estate Center

TABLE 3
AFFORDABLE HOME PRICE AND MONTHLY PAYMENT
By Level of Income
(Metropolitan Phoenix; Effective Interest Rate of 10.6 Percent)

Gross Monthly/Annual Income	Sales Price	Monthly Housing Payment	Affordability Index
$1,675/$20,000	$50,850	$470	100
$2,075/$25,000	63,000	580	100
$2,500/$30,000	75,900	700	100
$2,925/$35,000	88,800	820	100
$3,325/$40,000	101,700	940	100
$3,750/$45,000	113,850	1,050	100
$4,175/$50,000	126,750	1,170	100

Source: Arizona Real Estate Center, ASU College of Business

'87 Valley Inflation Bounces Back from '86 Record Low

The annual average increase during 1987 in the Metropolitan Phoenix Consumer Price Index bounced back to 4.1 percent from 1986's record low 1.3 percent. Despite the 1987 acceleration, inflation remained lower than in 1984 and 1985. Nearly all of the fluctuation since 1985 resulted from swings in oil prices, reflected most directly in the CPI's gasoline category.

Several methods may be used to calculate the inflation rate from the CPI. In this article, the annual average percent change is used: the average of the four quarterly index values for a year, compared to the average of the previous year. The other widely used method is employed in the quarterly CPI reports (see the February 1988 *Arizona Business).* It compares the index value at the end of the year to the value at the end of the previous year. Because the inflation rate accelerated during 1987, the annual average increase was less than the year-end inflation rate (4.7 percent).

TABLE 1
METROPOLITAN PHOENIX CONSUMER PRICE INDEX
Annual Average, Selected Items

Expenditure Category	*1987 Relative Importance*[1]	*1987 Index (1982-84 = 100)*	Percent Change *1987*	*1986*	*1985*
ALL ITEMS	100.0%	115.5	4.1	1.3	5.0
Food and Beverages	18.7	114.6	1.9	4.2	4.3
Food	17.5	114.2	1.8	4.0	4.3
Food at Home	11.3	114.4	2.5	4.1	4.1
Cereal and Bakery Products	1.5	125.0	4.4	5.8	7.6
Meats, Poultry, Fish, and Eggs	3.3	107.6	2.9	2.5	1.1
Dairy Products	1.5	110.6	2.8	2.7	3.3
Fruits and Vegetables	1.9	119.2	3.4	1.7	6.3
Other Food at Home	3.1	114.9	0.4	6.8	4.5
Food Away from Home	6.1	114.0	0.3	3.8	4.8
Housing	39.5	111.4	2.2	2.2	4.5
Shelter	25.8	112.6	2.0	3.5	5.2
Renters' Costs	8.5	117.6	–0.4	2.8	5.9
Homeowners' Costs	16.5	114.5	3.2	3.8	4.3
Fuel and Other Utilities	6.4	109.9	3.7	–2.0	1.8
Gas (piped) and Electricity	4.0	107.3	4.6	–3.7	1.6
Household Furnishings/Operations	7.2	109.1	1.2	1.4	4.4
Apparel and Upkeep	4.8	110.7	1.8	1.5	3.8
Transportation	21.2	114.3	8.9	–5.6	5.4
Private Transportation	19.6	114.6	9.4	–5.7	5.5
New and Used Cars	7.3	122.2	6.9	–1.2	4.2
Motor Fuels	5.5	82.5	9.5	–25.1	3.0
Public Transportation	1.6	107.8	3.0	–4.7	2.7
Medical Care	6.9	141.0	4.4	5.7	10.0
Entertainment	4.6	130.9	6.4	6.8	10.0
Other Goods and Services	4.3	125.5	5.9	4.6	5.4

[1] Expressed as a percent of all items. The relative importance of the seven major categories sums to 100.0 percent. Only selected detail items are shown; thus, the relative importance of these items will not sum to that of the major categories.

Source: Center for Business Research, College of Business, Arizona State University; in cosponsorship with Valley National Bank.

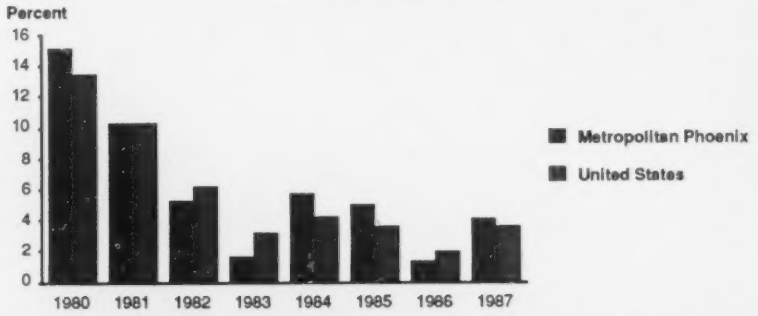
CONSUMER PRICES IN 1987

After plunging 25 percent during 1986, gasoline prices rose nearly 10 percent in 1987. Likewise, the entire transportation category swung from a 6 percent decline in 1986 to a 9 percent advance in 1987, accounting for all of the acceleration in the all-items inflation rate. Other than the other goods and services category, which advanced slightly more in 1987, each of the other major categories registered increases similar to or less than in 1986 (see Table 1).

Prices of food and beverages rose just 2 percent in 1987, following five successive years of approximately 4 percent gains. Food-away-from-home prices hardly changed, and food-at-home prices increased only 2.5 percent.

Housing costs, which account for 40 percent of the entire index, rose only 2.2 percent, matching the 1986 gain. Inflation in shelter expenses slowed as renters' costs decreased for the first time on record. This decline was offset, however, by an ad-

FIGURE I
METROPOLITAN PHOENIX AND U.S. CONSUMER PRICE INDEXES
Annual Percent Changes



Source: Center for Business Research, College of Business, Arizona State University; in cosponsorship with Valley National Bank.

CPI Description Available

A description of the Consumer Price Index is available on request from the Center for Business Research. It answers common questions concerning the CPI; for example:

- What is the difference between the CPI for all urban consumers (CPI-U) and the CPI for urban wage earners and clerical workers (CPI-W)?
- What is the relationship between the CPI and the inflation rate, and how is this rate calculated?
- Is the CPI a cost-of-living index?
- How is the CPI applied in contractual agreements?

A copy of the CPI description can be obtained by calling (602) 965-3961.

vance in fuel and utility costs; these rates had gone down in 1986.

Medical care inflation slowed further in 1987; prior to 1986, double-digit rates were measured in six of seven years. Apparel and upkeep costs barely rose for the second straight year, but entertainment costs continued to climb. Only in 1983 did entertainment expenses fail to rise at least 6 percent.

COMPARISON AREAS

The increase during the 1980s in the Metropolitan Phoenix CPI has barely surpassed the gain in the national CPI (see Figure I). In 1987, the rate in the Phoenix area was slightly higher only because of the more rapid acceleration in gasoline prices early in the year. Considerably greater inflation in the transportation category offset the area's lower inflation rates in most other categories (see Table 2).

Inflation in the Tucson area was slightly less than in the Phoenix area during 1987. Data on the Metropolitan Tucson CPI are available since 1983 from the Division of Economic and Business Research at the University of Arizona. Since the Tucson CPI began, the inflation rates in the two areas have been equivalent at just more than 20 percent for the nearly five-year period.

TABLE 2
CONSUMER PRICE INDEX
METROPOLITAN PHOENIX AND UNITED STATES
1987 Annual Average Percent Change

Expenditure Category	*Phoenix*	*United States*
ALL ITEMS	4.1	3.7
Food and Beverages	1.9	4.1
Housing	2.2	3.0
Apparel and Upkeep	1.8	4.4
Transportation	8.9	3.0
Medical Care	4.4	6.6
Entertainment	6.4	3.3
Other Goods and Services	5.9	5.8

Source: Metropolitan Phoenix data compiled by the Center for Business Research, College of Business, Arizona State University, in cosponsorship with Valley National Bank; other data are from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 3
METROPOLITAN PHOENIX CONSUMER PRICE INDEX
All Items (1982-84 = 100)

	Quarter				Annual
	I	*II*	*III*	*IV*	Average
1975	49.3	50.1	51.2	52.5	50.8
1976	52.5	53.0	53.9	54.6	53.5
1977	55.7	57.0	58.2	59.3	57.6
1978	60.7	62.5	64.3	66.1	63.4
1979	68.2	71.8	73.8	76.5	72.6
1980	81.8	81.9	84.0	86.7	83.6
1981	89.4	91.1	93.2	95.2	92.2
1982	96.7	97.2	98.2	96.2	97.1
1983	96.5	98.1	99.7	100.2	98.6
1984	102.1	103.6	105.4	106.1	104.3
1985	108.1	109.8	110.1	110.2	109.5
1986	110.3	110.8	111.5	111.4	111.0
1987	113.9	115.5	116.1	116.6	115.5

Source: Center for Business Research, College of Business, Arizona State University

New Base Period

As part of the periodic revision to the CPI (see the November 1987 *Arizona Business),* the U.S. Department of Labor rebased the CPIs they produce to 1982-84 = 100. (For each category, the average of the indexes for those three years was set to equal 100). The same base period has been adopted for the Metropolitan Phoenix CPI, effective with this report.

The all-items index will continue to be available on the old base (1977 = 100 for metro Phoenix) through 1988, but users are urged to convert to the new base immediately. The all-items index is shown in Table 3; similar historical data for other CPI categories, on the 1982-84 base, are available on request from the Center for Business Research.

The new index base will allow direct comparisons of index values for metro Phoenix to those for other areas for the first time. The shift changes the values of the indexes but does not affect percent changes calculated from the indexes, except for small differences due to rounding.

1987 FORECAST ACCURACY

Last year at this time, nearly all forecasts of 1987 national inflation fell within a 2.5-to-4-percent range. The annual average of 3.7 percent was slightly higher than the consensus value. The Center's forecast of Phoenix-area inflation – 3.5 percent – likewise was slightly too low, a result of the very rapid increase in gasoline prices at the beginning of the year.

1988 OUTLOOK

The annual average increase in the CPI is likely to barely exceed 4 percent in 1988, both nationally and in the Phoenix area. This implies year-to-year rates comparable to, or slightly less than, the year-end figures of approximately 4.5 percent in each area.

Nationally, the consensus forecast of *Blue Chip Economic Indicators* was 4.3 percent, with nearly all panelists predicting a rate between 4 and 5 percent. Locally, a 4.5 percent inflation rate is foreseen by the *Arizona Blue Chip* panel, with a range of 3.5 to 5.1 percent. The Center's forecast for the Metropolitan Phoenix CPI is slightly lower at 4.2 percent.

– **Tom R. Rex**
Research Manager

Metro Phoenix CPI

The Metropolitan Phoenix Consumer Price Index (CPI), on which these inflation figures are based, is prepared by the Center for Business Research in the ASU College of Business. The Center conducts comprehensive pricing surveys each quarter, in cosponsorship with Valley National Bank.

GSP Confirms Mid-1987 Quickening of Economic Expansion

Growth of the Arizona Gross State Product accelerated during mid-1987 from the slow rate recorded early in the year.

For the year ending third quarter 1987, GSP advanced an inflation-adjusted 5.4 percent, slightly less than the 5.7 percent long-term average. Adjusted GSP, which excludes the volatile mining and agriculture industries, rose 5.0 percent, up from the 3.8 percent annual rate of first quarter 1987 (see Figure I).

Unadjusted GSP growth was higher than the adjusted rate during first half 1987 because of agriculture's large gains (see Table 1). In the third quarter, however, both agriculture and mining GSP declined, resulting in a greater adjusted rate. Generally, the adjusted rate has a smoother, less extreme, quarterly pattern.

Second quarter GSP growth was substantially higher than previously reported; the first quarter rate was revised down slightly. The quarterly changes reported in Table 1 are subject to considerable further revision. In particular, the first quarter growth rate appears too low, offsetting a too-high rate estimate for fourth quarter 1986 (as indicated by data such as the coincident economic indexes).

SECTORAL GROWTH

The construction industry restrained Arizona's third quarter 1987 economic growth, declining 13 percent from its third quarter 1986 gross product and 16 percent from the second quarter 1986 peak. Construction employment dropped 11 percent (12,000 workers) during the year ending third quarter 1987.

The manufacturing industry led industrial growth, posting a 10 percent gain for the year ending third quarter 1987. It was followed by transportation, communications and public utilities; finance, insurance and real estate; and trade, each of these industries growing at least 6 percent.

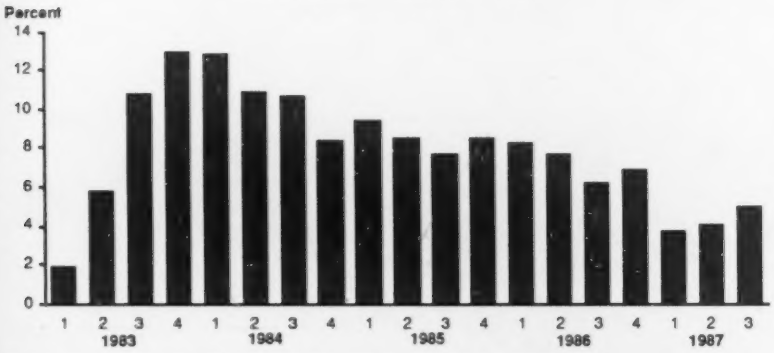
At 3 percent, the government sector continued its slow expansion. Since 1970, its growth rate has exceeded that of the overall economy only during recessionary years. Government's total growth since 1970 (78 percent) was barely one-half as fast as that of the entire GSP (153 percent). Employment in this sector also rose much less (97 percent vs. 151 percent).

OUTLOOK

Moderate growth characterized the Arizona economy between May and August 1987, resulting in adjusted GSP growth rates of 1.5 percent for both the second and third quarters. The expansion slowed in the fall, however, according to the coincident indexes; fourth quarter GSP growth probably was below average. Subpar growth should continue through 1988.

– **Tom R. Rex**
Research Manager

FIGURE I
PERCENT CHANGE IN ADJUSTED GSP
From Same Quarter, Prior Year



Source: Center for Business Research, College of Business, Arizona State University

TABLE 1
ECONOMIC GROWTH

	Arizona Gross State Product				Gross National Product
Quarter	*Billions of Current Dollars, Annualized*	*Quarterly Percent Change (1982 Dollars)*	*Quarterly Percent Change (Adjusted GSP)**	*Annual Percent Change (Adjusted GSP)**	*Annual Percent Change (1982 Dollars)*
First 1986	51.648	3.0	2.6	8.2	3.6
Second 1986	51.965	0.9	1.1	7.9	3.3
Third 1986	52.456	0.2	0.7	6.2	2.6
Fourth 1986	53.673	2.3	2.5	7.0	2.2
First 1987r	55.269	0.1	-0.6	3.8	2.0
Second 1987r	56.458	2.1	1.5	4.2	2.4
Third 1987	57.463	0.9	1.5	5.0	3.2

*The adjusted GSP is the annualized GSP in billions of 1982 dollars, minus the contributions of the agriculture and mining industries.

rRevised; quarterly estimates are subject to significant revision.

Source: Center for Business Research, College of Business, Arizona State University. GNP data are from the U.S. Department of Commerce, Bureau of Economic Analysis.

January Purchasing Indicators Up; Prices Jump

All indicators of economic performance were upbeat in January, with the strength reflected in increasing production, employment, and vendor lead times. An unusually high increase in prices signals a growing inflationary problem. Inventory accumulation continued, for the sixth straight month, causing concern about a growing overhang.

As the economy begins its sixth year of growth, it looks a lot livelier than most forecasters had expected after the October financial market downslide. A softening of interest rates in February will help keep the expansion going, although upward price pressures will be a growing problem. Moderate growth should occur throughout 1988, with little chance of a downturn.

PRICES

Prices paid for purchased items jumped in January – the highest increase rate in seven years (since January 1981). The price trend line began tilting upward early in 1987, and the January increase rate indicates that inflation has become a more serious problem. Further new order and production growth will place continuing upward pressure on prices.

DELIVERY TIME

Delivery time on vendor shipments continued to stretch, at about the same rate as in December. Lead times began to lengthen noticeably last June, and the rate of increase has extended at a consistent rate since – typical in an expanding economy.

INVENTORY LEVELS

Inventory levels of purchased materials rose in January, following December's level performance. This increase was the sixth in a row and the largest since September. Inventory levels must be watched closely, for any large upward tilt warns of an inventory overhang, making the economy susceptible to a sharp downswing. However, this may work itself out if new order and production rates continue to increase.

NEW ORDERS

New orders received from customers also went up, at the same rate as in the previous month. While these increases portray a growing economy, both were smaller than in any month since December 1986 and much lower than in the first 11 months of 1987. The expansion appears to be losing some of its bounce.

PRODUCTION

Production accelerated in January at a rate four times greater than in December. Both November and December data reflected very low rates of increase. However, the rate is now back up to the levels of early 1987. If production keeps advancing, it will positively impact employment in the months to come.

EMPLOYMENT

Employment by Arizona firms grew at a greater rate in January than in December – the 13th consecutive monthly hike. Although the increase rate is still a bit lower than those seen in the early months of 1987, it is quite respectable. Employment has grown impressively in almost every month since early 1983.

PURCHASES

Purchases of materials and supplies enjoyed a good increase that was greater than the December rate. This substantial growth was triggered by the jump in production.

– Harold Fearon

Dr. Fearon is the National Association of Purchasing Management Professor in the ASU College of Business.

Arizona Purchasing Survey

Now in its 26th year of monthly reporting, Dr. Harold Fearon's survey of Arizona business conditions utilizes data gathered at the close of each month from members of the purchasing management associations of Arizona and southern Arizona. They indicate the direction - higher, unchanged, or lower - of seven key measures of economic activity in the month just ended. These purchasing managers deal daily with supply, demand, and price factors in the marketplace; their aggregate readings have accurately charted the state's economic course for two decades, providing timely data on turning points.

TABLE 1
JANUARY PURCHASING SURVEY

	Percent of Purchasing Managers Indicating Each Response (January compared to December)		
Key Indicators	*Higher*	*Same*	*Lower*
Prices paid for major commodities	61	37	2
Delivery time from vendors	42	48	10
Purchased materials inventory level	35	40	25
New orders received	34	43	23
Production	36	48	16
Employment	22	69	9
Purchases	46	33	21

Source: Purchasing Management Association of Arizona and the Purchasing Management Association of Southern Arizona

Arizona Leading Index Continues Retreat in December

The Arizona Index of Leading Economic Indicators posted its second consecutive decline in December, to 109.8, one full percentage point below November's revised 110.8 (see Figure I).

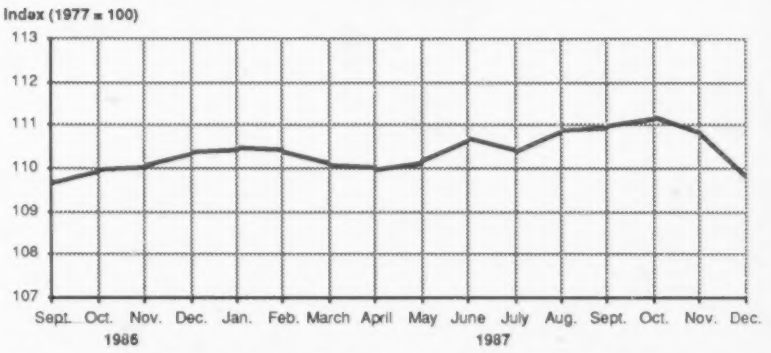
Based on 10 statistical economic indicators, the index is designed to predict economic activity up to six months in the future. Seven of the 10 components fell in December.

The greatest negative influence came from a seasonally adjusted decrease in the value of residential building permits, which now has declined in eight of the last 12 months.

Four of the five seasonally adjusted components derived from a survey of Arizona purchasing managers exerted a negative influence in December. Changes in supplier delivery times, inventory levels, new orders, and production pulled the index down; employment was unchanged. Sensitive prices and unemployment claims both lost ground.

The national money supply (M2) rose again, on a seasonally adjusted basis, after falling in November. The other positive influence on the index was a rise in weekly hours worked in Arizona manufacturing establishments.

FIGURE I
ARIZONA INDEX OF LEADING ECONOMIC INDICATORS



Source: Economic Outlook Center, College of Business, Arizona State University

TABLE 1
NET CONTRIBUTION OF INDIVIDUAL COMPONENTS TO THE ARIZONA INDEX OF LEADING ECONOMIC INDICATORS

	Net Contribution+			
	Sept.	*Oct.*	*Nov.*	*Dec.*
Delivery Time*	.05	–.01	–.02	–.07
Inventory Levels*	.03	–.06	.07	–.11
New Orders*	–.02	–.01	.07	–.12
Production*	–.05	.02	–.07	–.04
Employment*	–.04	.07	–.01	.00
Residential Building Permits	.32	–.16	.13	–.45
Unemployment Insurance Claims	–.10	.17	–.20	–.07
Average Workweek, Manufacturing	–.25	.09	–.07	.05
Money Supply	.13	.09	–.16	.02
Change in Sensitive Materials Prices	–.05	.00	–.07	–.13
OVERALL INDEX CHANGE (%)	.02	.22	–.33	–.93

+The net contribution of each component is calculated by multiplying the monthly percent change in its index by its relative importance.

*Based on indicators from the purchasing management associations of Arizona and southern Arizona.

Source: Economic Outlook Center, College of Business, Arizona State University

OUTLOOK

The index moved upward throughout most of 1987 at a slow and erratic pace, flattening in the spring and finally rising to a new high in October. The final two months brought decreases in the index, which returned it to a level slightly less than that of early 1987.

Movements in the index have been consistent with the recent performance of the Arizona economy. Although a record number of people are employed, the pace of growth is sluggish compared to the early years of the current economic expansion. It is likely 1988 will be another year of relatively slow growth in Arizona.

During the previous 12 months, the value of residential building permits – a key index component – has declined in eight months. With Arizona population inflows slowing and interest rate uncertainty, neither the necessary supply nor demand conditions exist that would produce dramatic increases in residential activity.

In spite of the falling dollar, employment has not responded as strongly as some analysts expected. Yet, Arizona is still likely to benefit from the weakened dollar as tourism increases and semiconductor firms improve their competitive position in foreign markets.

Although the leading index is now at its lowest level of the past 12 months, the pattern of increase followed by decline offers no significant cause for alarm. The performance of the Arizona economy during first half 1988 should be similar to that of the closing months of 1987. Growth should be positive, but the economic expansion will continue to weaken.

– **Tracy L. Clark,** *Economist*
Economic Outlook Center

ARIZONA ECONOMIC INDICATORS

	Month or Quarter	Value	Percent Change from Previous Period	Percent Change from Year Ago	Year-to-Date Value	Year-to-Date Percent Change from Year Ago
GROSS STATE PRODUCT						
(In Billions of Dollars, at Annual Rate)						
Arizona - Current Dollars	3rd Qtr.	57.463	1.8	9.5	NA	NA
Arizona - 1982 Dollars	3rd Qtr.	48.334	0.9	5.4	NA	NA
CONSUMER PRICE INDEX (1982-84 = 100)						
Metropolitan Phoenix	4th Qtr.	116.6	0.4	4.7	NA	NA
INDEX OF LEADING ECONOMIC INDICATORS (1977 = 100)						
Arizona	Dec.	109.8	–0.9	–0.5	NA	NA
BUILDING PERMITS						
(Total Dollar Value in Thousands)						
Maricopa County	Dec.	203,131	–7	–6	3,848,426	–1
Pima County	Dec.	45,729	6	–9	596,451	–26
Balance of State	Dec.	42,746	15	–14	657,726	–3
Arizona	Dec	291,606	–2	–8	5,102,603	–5
TOTAL HOUSING UNITS AUTHORIZED						
Maricopa County	Dec.	2,065	31	11	28,729	–34
Pima County	Dec.	249	26	–82	6,139	–51
Balance of State	Dec.	953	3	3	11,063	–12
Arizona	Dec.	3,267	21	–21	45,931	–33
HOME SALES						
Maricopa County - Number	Dec.	3,240	–29	–50	59,250	–6
Maricopa County - Median Price	Dec.	83,275	1.4	4.4	80,050	2.6
HOUSING AFFORDABILITY INDEXES						
Metropolitan Phoenix - New Homes	4th Qtr.	87	–5.4	–12.1	NA	NA
Metropolitan Phoenix - Resale Homes	4th Qtr.	106	–2.8	–7.8	NA	NA
MORTGAGE INTEREST RATES						
(Conventional, 30-year, Fixed-rate)						
Maricopa County	Jan.	10.4	–1.9	14.3	NA	NA
POPULATION ESTIMATES						
(In Thousands)						
Maricopa County	4th Qtr.	1,993	0.5	2.7	NA	NA
Arizona	4th Qtr.	3,443	0.5	2.4	NA	NA
ELECTRICAL POWER SALES						
(In Millions of Kilowatt Hours)						
Arizona	Dec.	3,274	18.9	15.0	38,804	8.1

NA = Not Applicable

Source: Center for Business Research, College of Business, Arizona State University

ARIZONA BUSINESS (ISSN 0093-0717) is mailed free to Arizona residents. The annual out-of-state subscription rate is $12 ($15 foreign). Persons wishing to be placed on the mailing list should send their name and address to the Center for Business Research, College of Business, Arizona State University, Tempe, AZ 85287; or call (602) 965-3961.

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ARIZONA BUSINESS is published monthly by the Center for Business Research, College of Business, Arizona State University. Articles do not necessarily reflect the views of the Center, College, or University. Authors are solely responsible for the accuracy and content of their articles. Permission to reprint articles granted upon request. Second class postage paid at Tempe, Arizona 85282.

ARIZONA BUSINESS is available on microfilm and in xerographic copies from University Microfilms, Ann Arbor, Michigan 48106.

John Kraft, Dean
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SDT Acquisitions
Congressional Info Service
8520 East-West Highway
Bethesda MD 20814